

ARGUS Ball Valve FK and HK

High Performance Ball Valves

VAIOM001024

*Translation of the Original Instructions***Installation
Operation
Maintenance**

These instructions must be read and observed before using an ARGUS ball valve.

Also read and observe the superior instructions VAIOM001028 before using an ARGUS ball valve automated by Flowserve Flow Control GmbH.





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1 General Information

1.1 Scope of Manual

These instructions are intended to familiarise the reader with the ARGUS ball valve and its proper use. Use of the ARGUS ball valve in compliance with these instructions is important to ensure its functionality and to avoid hazards.

These instructions contains information for qualified personnel for using the ARGUS ball valve for its intended purpose.

Often, ARGUS ball valves are automated with a mounted pneumatic, hydraulic, or electric actuator with the corresponding control instrumentation for automated functioning and monitoring of the complete automated ball valve. For automated ball valves, these manual forms part of the comprehensive user documentation for the equipment. The instructions for all components must be observed.

	Read these instructions before using the ARGUS ball valve in any region worldwide and pay particular attention to the safety-relevant warnings, information and notes.
	Do not put the ARGUS ball valve into operation until all the safe conditions referred to in these instructions are satisfied.
	Failure to observe the information contained in these instructions will be considered as misuse of the product. Personal injury, product damages, holdups in operation or product failure due to misuse of the product are not covered by the Flowserve guarantee.
	Observe all the relevant local health and work safety regulations at the place of work – even when these are not explicitly referred to in these instructions.
	Coordinate all repair work with the operating personnel and observe all safety regulations of the industrial plant and applicable health and safety laws.
	Inform Flowserve Flow Control GmbH if documents are missing or incomplete. You will then receive replacements in electronic form.
Provide these instructions at all workplaces near the production site.	

1.2 Disclaimer

The information in these instructions can be considered as complete and reliable. Despite all efforts of Flowserve Flow Control GmbH to supply comprehensible information and instructions, good engineering and safety practice must be applied at all times. Please consult a qualified engineer if in doubt.

Flowserve Flow Control GmbH manufacturers products according to applicable international quality management standards which are audited by external quality assurance organisations. Original spare parts and original accessories have been designed, tested and incorporated into Flowserve products to ensure continuous product quality and product performance in use. Since Flowserve Flow Control GmbH cannot test the spare parts and accessories of other manufacturers, (incorrect) installation of these parts can have a detrimental effect on the performance and safety properties of the product. The wrong choice or incorrect installation or failure to use approved Flowserve spare parts and accessories will be considered as misuse of the product. Damage or failure due to product

misuse is not covered by the Flowserve guarantee. Moreover, any modifications to Flowserve products or the removal of original components can impair the safety of the products in use.

1.3 Certification Instruction

The design of ARGUS ball valves takes all relevant laws, directives, standards, and specifications into account, such as the European Directive for Pressure Equipment 2014/68/EU, EN 12516, AD 2000 Regulations, API 6D, API608 and ASME/ANSI B16.34 and others, depending on the specified application.

The careful selection, design and calculation of materials as well as quality assurance performed during materials procurement, in production and on finished products ensure the elimination of pressure-related hazards when the ARGUS ball valves are used as intended.

As a manufacturer, Flowserve Flow Control GmbH applies the conformity assessment procedure according to module H (Article 14 of European Pressure Equipment Directive 2014/68/EU), i.e., "Comprehensive Quality Assurance" as described in Appendix III, Paragraph 11.

ARGUS ball valves are marked according to the provisions of the European Pressure Equipment Directive with the CE mark as well as the identification number of the notified conformity assessment body if sold in the European Union or otherwise specified.

For the ARGUS ball valves, which are covered by the provisions of the European Pressure Equipment Directive 2014/68/EU, the EU declaration of conformity is part of these instructions.

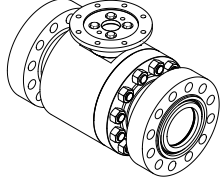
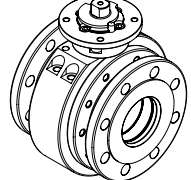
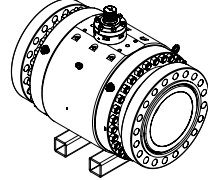
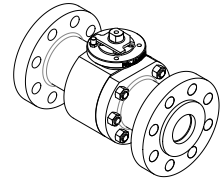
1.4 Units

Units used in these instructions:

- Dimensions: Metric
- Torque units: Nm

2 Technical Data

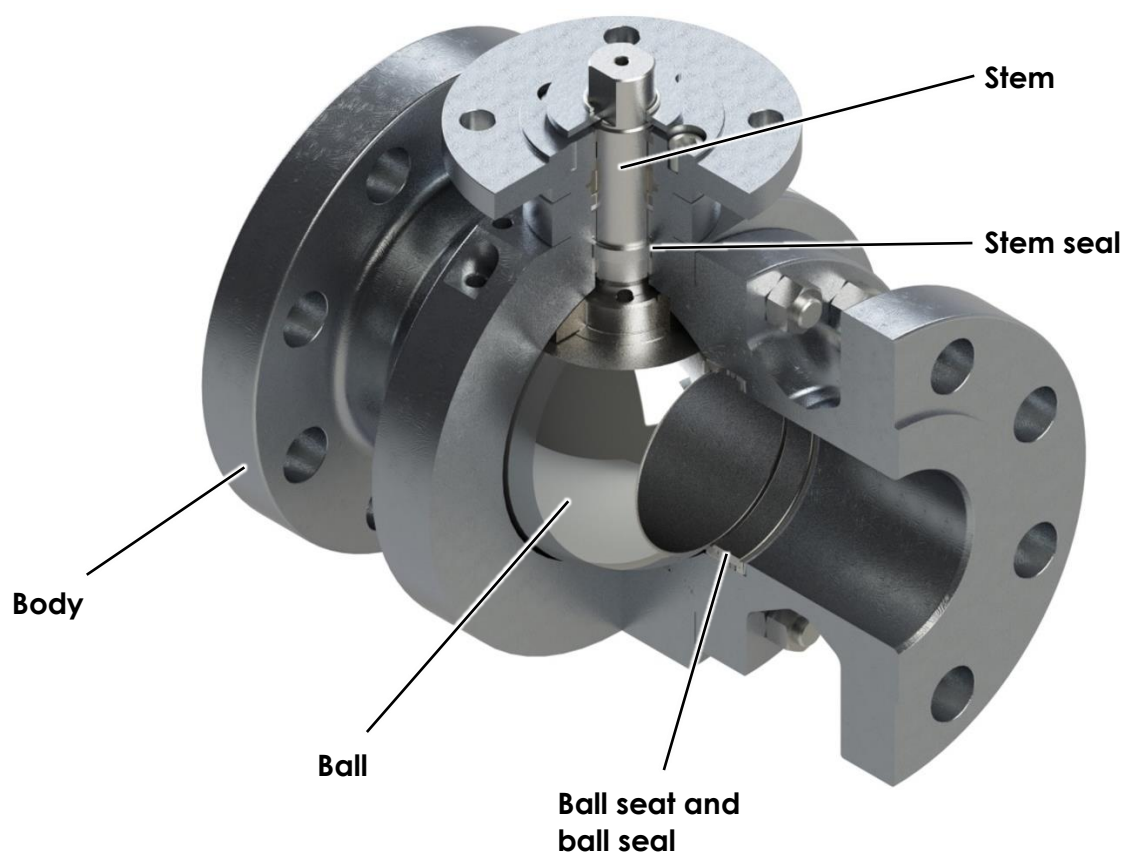
2.1 Specification

					
Series		HK 35	FK 75M / FK 75	FK 76M / FK 76	FK 79
Design		Trunnion-mounted ball	Floating ball	Trunnion-mounted ball	Floating ball
DN range		DN 40 – 500, 1½" – 20" Full or reduced passage	DN 80 – 200, 3" – 8" Full or reduced passage	DN 80 – 900, 3" – 36" Full or reduced passage	DN 15 – 100, ½" – 4" Full or reduced passage
PN-range	PN	10 – 250	16 – 40	16 – 160	16 – 250
	ANSI/ASME Class	600 – 2500	150 – 300	150 – 900	150 – 2500
Connections		Flange connection	Flange connection	Flange connection	Flange connection
Body materials		– Fine-grain steels (forged or cast) – High-grade steels – Special steels e.g. Duplex SS Monel Inconel Hastelloy Alloy 20	– Fine-grain steels (forged or cast) – High-grade steels – Special steels e.g. Duplex SS Monel Inconel Hastelloy Alloy 20	– Fine-grain steels (forged or cast) – High-grade steels – Special steels e.g. Duplex SS Monel Inconel Hastelloy Alloy 20	– Fine-grain steels (forged or cast) – High-grade steels – Special steels e.g. Duplex SS Monel Inconel Hastelloy Alloy 20
Ball seal (seat materials)		– POM – DEVLON – PEEK (LYTON) – ARGULLOY (metallic) – CRABIDE (metallic)	– PTFE – POM – DEVLON – PEEK (LYTON) – ARGULLOY (metallic) – CRABIDE (metallic)	– PTFE – POM – DEVLON – PEEK (LYTON) – ARGULLOY (metallic) – CRABIDE (metallic)	– PTFE – POM – PEEK (LYTON) – ARGULLOY (metallic) – CRABIDE (metallic)
Special versions & accessories		Obtainable through Flowserve catalogues and data sheets or contact Flowserve Flow Control GmbH.			



2.2 Main Components of a Ball Valve

This figure shows the main components of a ball valve. The delivered ball valve may be a different model.

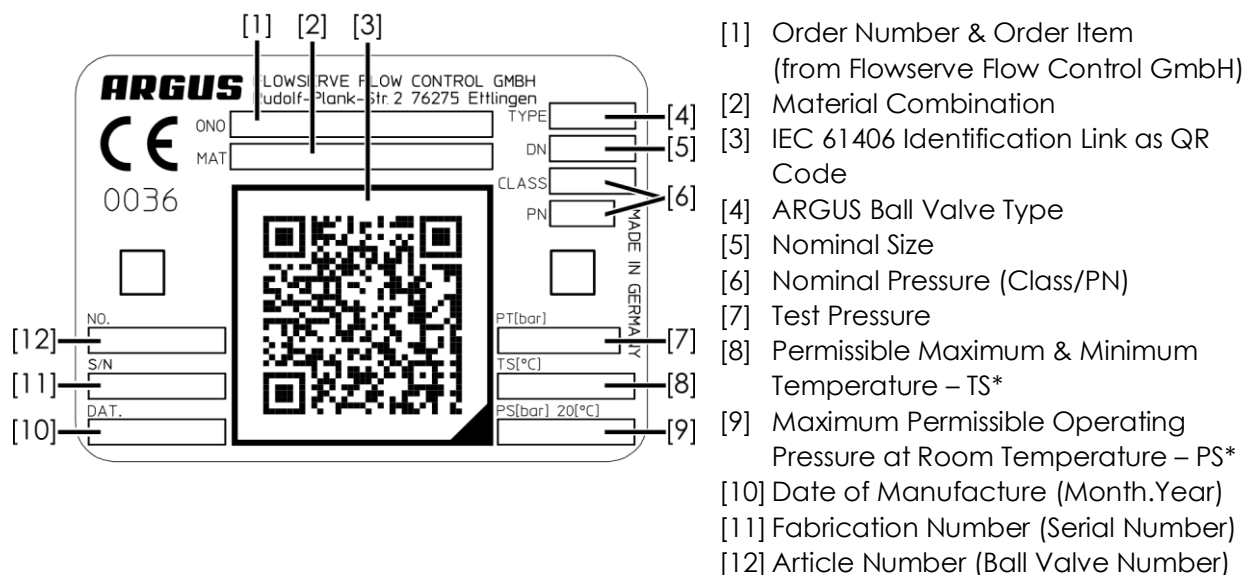


2.3 Operating Parameters/Limits of the ARGUS Ball Valve

ARGUS ball valves are designed for special applications. Series (Type), material selection, nominal size, special features, attachments, accessories, and valve qualification are adapted to the specified operating conditions. This results in operating parameters/limits concerning fluids (media), pressure, temperature, and environmental conditions for each ARGUS ball valve.

2.4 Nameplate

The nameplate permanently affixed to the ball valve body provides the most important information regarding the design and use of the ARGUS ball valve.



If the nameplate is missing or illegible, do not put the ARGUS ball valve into operation. Instead, contact Flowserve Flow Control GmbH for support.

*Observe temperature-dependent limit values for the pressure load for non-metallic sealing material. Refer to Annex C: Pressure-Temperature Diagrams for Ball Seats.

CE marking according to European Pressure Equipment Directive 2014/68/EU (PED):
According to the provisions of European Pressure Equipment Directive 2014/68/EU, ARGUS ball valves and equipment classified in Category II and above are marked with the CE symbol and the identification number of the notified body ("0036"). ARGUS ball valves in Category I are marked with "CE" only. ARGUS ball valves which, due to their design, are not covered by the Directive or sold outside the European Union do not bear the CE marking. The attached EU conformity declaration according to 2014/68/EU certifies that the provisions from the Directive have been fulfilled for the affected ARGUS ball valves and equipment.

In addition to the essential information given on the nameplate, the ball valve may come with supplementary stamping, plates, decals, or labels in compliance with statutory regulations, client specification, special application rules or to advise particular application limits.

3 Safety Information

3.1 Intended Use

The ARGUS ball valve is used as a shut-off device within its operating parameters/limits appropriate for the application, e.g., in piping or on containers in the areas of processing, transport and treatment of liquids, gases and solid-containing fluids. It is either operated manually or its function is automated using an actuator and the corresponding control system.

ARGUS ball valves are generally suitable for operation in potentially explosive atmospheres. When used as intended, the ARGUS ball valves do not have their own potential sources of ignition and are therefore not "equipment" as defined by Article 1 of Directive 2014/34/EU ("ATEX Directive").

Non-intended use (only reasonably foreseeable misuse) is present in the following cases:

- The ARGUS ball valve is operated as a control valve with linear flow characteristics.
- The ARGUS ball valve is operated outside its operating parameters/limits stated on the ARGUS ball valve nameplate.
- The ARGUS ball valve is installed, commissioned, maintained, repaired or worked on in any way that is not in compliance with these instructions.
- The ARGUS ball valve is operated without regard to the labels, such as arrows designating the installation orientation, warning signs, etc.
- The ARGUS ball valve is modified or used with spare parts not supplied by Flowserve Flow Control GmbH.
- The ARGUS ball valve is operated without having successfully passed all inspection acceptance criteria.
- The ARGUS ball valve is operated in a partially assembled condition.

If there is any doubt as to the suitability of the ARGUS ball valve for the application intended, contact the *Quick Response Center (QRC)* at Flowserve Flow Control GmbH for advice, quoting the serial number or article number of the ARGUS ball valve as stated on the nameplate.

If the application conditions change (e. g., fluid, temperature or pressures) contact the *Quick Response Center (QRC)* at Flowserve Flow Control GmbH for support before putting the ARGUS ball valve in operation again.

Any non-intended use of the ARGUS ball valve may compromise its function. This leads to invalidation of any product warranty claims!

3.2 Safety Symbols and Description

These instructions contain specific safety messages with signal word fields which, if unheeded, could constitute a hazard. The specific signal word fields are:

Signal word field	Description
	DANGER This signal word field indicates an immediate dangerous activity which can result in death or severe injury. Observe all safety messages with this signal word field to avoid the danger.
	WARNING This signal word field indicates a potentially dangerous activity which can result in death or severe injury. Observe all safety messages with this signal word field to avoid the danger.
	CAUTION This signal word field indicates a potentially dangerous activity which can result in slight or minor injury. Observe all safety messages with this signal word field to avoid the danger.
	NOTICE This signal word field indicates an activity which can lead to material damage. Observe all safety messages with this signal word field to avoid the danger.

Symbol/Warning Sign	Description
	DANGER FROM MOVING PARTS
	DANGER FROM HOT SURFACES
	DANGER FROM COLD SURFACES

3.3 Operating Limits

The nameplate permanently attached to the ARGUS floating ball valve body indicates the operating parameters/limits of the equipment. The maximum permissible operating pressure and the maximum permissible operating temperature must never be exceeded.

3.4 General Hazard Sources

3.4.1 Mechanical Hazards

Lifting limits and guidelines

The load values mentioned in this section are Flowserve recommendations only. All lifting must be done in compliance with site safety protocol, local regulations, and related industry standards.

Many precision parts have sharp corners which require appropriate personal protective equipment during handling. Prior to any attempt to lift an item, employees must first determine the approximate weight and stability of the load.

- Large, unstable, or awkward loads should always be handled with the assistance of additional personnel or appropriate mechanical means.
- Loads in excess of 15 kg should only be lifted by appropriate mechanical means and in accordance with current local legislation or with the assistance of additional personnel.
- Lifting items less than 15 kg may be prohibited without assistance if the lift is repetitive and/or awkward (i.e., away from the body, above the shoulders or below the knees) thus placing excessive stress on the personnel.
- Repetitive lifting of any kind should be evaluated as part of a documented end-user safety program.

Other mechanical hazards

- Unanchored piping that will cause valve deformation or gasket sealing is not acceptable and the responsibility of the installer.

3.4.2 Electrical, Hydraulic, Pneumatic Hazards

When the ball valve is equipped with a pneumatic, electric, or hydraulic actuation systems, particular risks arise from the automated functioning, the operation of the instruments, or at the function test. The valve must never be operated when uninstalled from the pipeline.

- Automated ball valves may only be operated when installed in a pipeline.
- Outside the pipeline, the actuation system shall be stored in an unpressurized and de-energized state.
- In case a function test of the uninstalled unit is necessary, the interior of the valve must be capped in a way that no limbs can enter.
- Safe distance must be kept from moving parts.

Electric hazards must be avoided. Uncontrolled pneumatic or hydraulic energy may cause severe injuries. Instrumentation and actuation components must be suitable for the operating environment.

3.4.3 Stored Energy hazards

A valve is pressure bearing equipment usually integrated into a piping system. Any hazard for persons or for the environment which might arise from the pressurized substances ("fluids") being transported within the pipeline system must be eliminated.

The careful selection, design and calculation of materials as well as quality assurance performed during materials procurement, in production and on finished products ensure the elimination of pressure-related hazards when the ARGUS ball valve are used as intended.

- The manufacturer nameplate permanently attached to the ball valve body indicates the operating limits of the equipment.
- The maximum permissible pressure and the maximum permissible temperature must never be exceeded.
- The fluids transported and treated must comply with the specification applied for the valve design.
- Legislation, directives, and regulations must be followed.

3.5 Responsibility of the Operating Company

ARGUS ball valves are frequently used as safety-relevant components in industrial plants and pipeline systems. The owner company is responsible for the intended use or intended operation of the ARGUS ball valve. They will take all the necessary preventive safety measures to protect the personnel and the environment.

The owner company is responsible for taking the following preventive safety measures:

- All applicable laws, technical safety regulations and standards, rules for avoiding accidents and protecting the environment as well as company regulations shall be observed and enforced.
- The ARGUS ball valve is operated in a manner which is not consistent with these instructions, particularly safety instructions, handling instructions and section 3.1 Intended Use.
- The operating conditions and limits of the ARGUS ball valve shall be continuously monitored and all risks ensuing from operation of the ARGUS ball valve shall be eliminated.
- Personnel operate the ARGUS ball valve who are not sufficiently qualified to carry out their respective activities. The personnel shall be provided with extensive personal protective equipment (PPE) and suitable tools.
- No original spare parts or accessories of Flowserve Flow Control GmbH are used.
- Unauthorized changes are made to the ARGUS ball valve.

3.6 Qualified Personnel and Targeted Group

All personnel involved in the operation, installation and maintenance of the unit must be qualified to carry out the work involved. If the personnel in question does not already possess the necessary knowledge and skill, appropriate training and instruction must be provided. If required, the operator may commission the manufacturer / supplier to provide applicable training.

Always co-ordinate repair activities with operation and health and safety personnel and follow all plant safety requirements and applicable safety and health laws and regulations.

3.6.1 Personnel Qualification

Any personnel of the operating company that works with the ARGUS ball valve must have appropriate knowledge and skills and fulfill the following conditions:

- Sufficient qualification and personal suitability for the respective activity.
- Knowledge of the personal protective equipment (PPE) and the way this equipment functions.
- Knowledge of these instructions, particularly of safety messages and sections relevant to the activities to be performed.

3.6.2 Target Groups

These instructions address the following target groups:

- Management: The operating company's management carries out the compliance and organizational management activities.
- Specialist Staff: Completed specialist training, has experience and knowledge of the relevant specifications and appropriate working equipment, specialist staff can perform the task assigned to them and recognize and eliminate any possible work-related dangers by themselves.
- Trained Persons: Trained persons have received training provided by the operating company about the tasks they are to perform and work-related dangers.

3.7 Personal Protective Equipment

It is the responsibility of the owner/operator to provide the operating personnel with high-quality personal protective equipment (PPE). This personal protective equipment must also be suitable for work on the ARGUS ball valve within the scope of the life cycle. The following personal protective equipment must be provided by the owner company:

Personal Protective Equipment	
	Protective helmet
	Protective goggles
	Protective clothing
	Protective gloves
	Protective shoes
 	Protective respiratory mask

3.8 General Safety Messages

This section points out general sources of danger/residual risks that exist during intended and non-intended use (only reasonably foreseeable misuse).

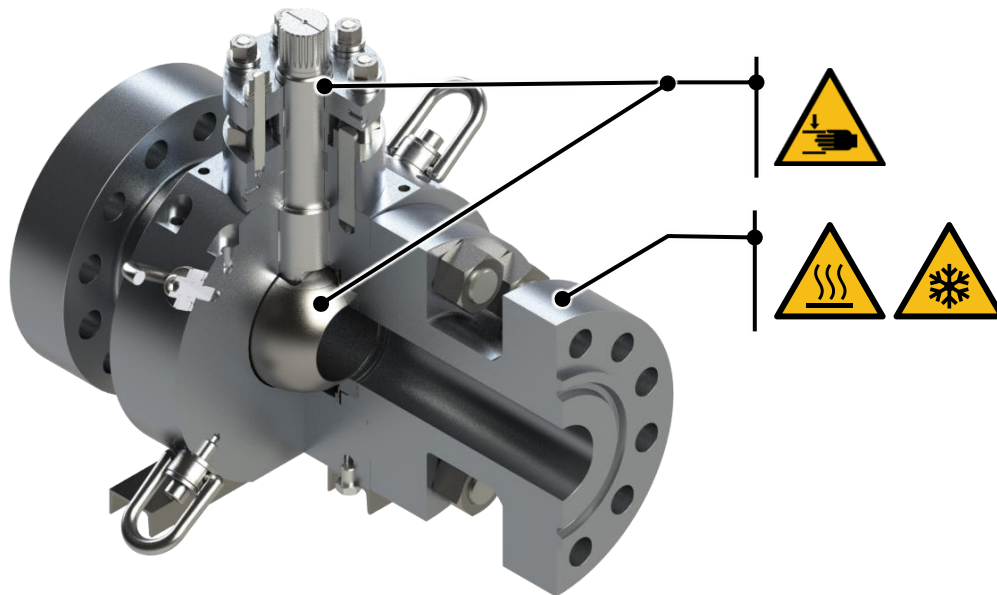


Figure 1: General sources of danger/residual risks on a ball valve

⚠ DANGER

Risk of injury due to bursting of ball valve parts due to exceeded operating parameters/limits!

Exceeded operating parameters/limits may cause severe injury or death.

- ▶ Never exceed the operating parameters/limits of the ball valve stated on the nameplate.

⚠ WARNING

Risk of injury due to ball valve parts in motion!

A ball valve wrench and ball which are in motion may cause crushing and/or amputate limbs.

- ▶ Do not reach between the ball valve wrench and the ball valve guide washer.
- ▶ Do not reach into the bore of the ARGUS ball valve.
- ▶ Wear appropriate safety gloves.

⚠ WARNING

Risk of injury due to hot or cold ball valve body!

Contact to a hot or cold ball valve body may cause severe burns or frostbite.

- ▶ Let the ARGUS ball valve cool down/heat up after decommissioning.
- ▶ Wear appropriate safety gloves.

⚠ WARNING

Risk of injury due to automated operation!

In automated operation moving parts may cause severe injury or death.

- ▶ Keep hands, hair and clothing away from all moving parts.
- ▶ Observe the instructions of the actuator.

4 Product Description

4.1 General Product Description

The ARGUS ball valve has many innovative design features that represent the highest standards in valve technology.

The ARGUS ball valve FK and HK series are used as bubble-tight shut-off devices or shut-off valves in piping systems and containers used for processing, handling and transporting liquid or gaseous substances and solid materials.

ARGUS ball valves are composed of a body with a recess for a cylindrical perforated ball for rough flow control. The ball is either trunnion-mounted or floating.

Depending on the size, the ARGUS ball valves can be opened and closed manually with a ball valve wrench, a handwheel (with or without gearbox) or automatically by a hydraulic, pneumatic or electric actuator.

The ARGUS ball valve is open when the hole of the ARGUS ball valve is in line with the flow and closed when it is turned by 90 degrees. The wrench lies flat in alignment with the flow when open, and is perpendicular to it when closed, allowing easy visual confirmation of the valve's status.

4.2 Design Features

The ARGUS ball valves FK and HK series can feature the following major construction/design characteristics:

- Two-piece/three-piece split body design with flanged connection
- Soft or metal ball seal (soft or metal ball seated/sealing)
- Trunnion-mounted ball
- Floating ball
- Anti-blow-out and anti-static stem
- Spring supported ball sealing (up to DN 300) with cavity pressure relief
- Seat area supported by coil springs (from DN 350) with cavity pressure relief
- Long life double stem sealing system
- Body design in compliance with EU Pressure Equipment Directive (PED), AD 2000, EN 12516 and EN 1092-1
- Body design in compliance with API 6D or API 608 or ASME B16.34, B16.5, B16.47, B16.10
- Sealing design compliance in accordance with EN ISO 15848 fugitive emissions requirements and TA-Luft (VDI 2440)
- Fire safe compliance in accordance with EN ISO 10497 and API 607
- Connecting plate design in accordance with EN ISO 5211 for easy assembly with actuators
- Sizes available from DN 15 (1/2") to DN 900 (36") with full or reduced bore
- Supported pressure classes from PN 10 to PN 250 (ASME Classes 150 to 2500)
- Standard temperature range from -50 °C to +400 °C (ARGUS ball valves with special features excluded)

Note that the actual design features of the ARGUS ball valve are specified in the delivery documents.

4.3 Scope of Delivery

The scope of delivery normally includes the following components:

- ARGUS ball valve (usually operated in open position)
- Wrench, wrench head with tube or handwheel
(only for ball valves that are intended for manual operation)
- Protective caps
- Instructions including the EU Declaration of Conformity and Incorporation
- Order related documents (e.g., material certifications)
- Documents required by law and regulations

5 Packaging, Transportation and Storage

5.1 Safety Messages



*In order to prevent personal injury and/or property damage, ensure that verification and unpacking work is only carried out by qualified personnel with appropriate personal protective equipment (PPE) and suitable work tools.
☞ See Chapter 3 Safety Information.*

⚠ DANGER

Risk of injury due to falling loads!

Incorrect attachment of loads may cause severe injury or death.

- ▶ Correctly attach the ARGUS ball valve and/or actuator.
☞ See following Section Transportation and the superior instructions VAIOM001028.
- ▶ Never stand under heavy load.

NOTICE

Risk of property damage due to improper handling!

Improper handling of the ARGUS ball valve may cause damage.

- ▶ Use protective packaging materials to protect the ARGUS ball valve from damage during transport (e.g., packaging cover).
- ▶ Follow the procedures specified in the section below closely.

5.2 Consignment Receipt

A delivery document (delivery note) is enclosed with each delivery.

The details on the nameplate of the ARGUS ball valve allow clear identification and must correspond with the details on the delivery document (delivery note).

5.2.1 Unpacking the ARGUS Ball Valve

1. Open the packaging.
2. Loosen and remove all load securing material.
3. Safely lift the ARGUS ball valve out of the packaging.
☞ See chapter 5.3 Transportation.
4. Dismantle or break down the packaging.
5. Properly dispose any unneeded packaging and load securing material.
☞ See Chapter 10.4 Disposal and Recycling.
6. Safely transport the ARGUS ball valve to its place of operation.
☞ See chapter 5.3 Transportation.

5.2.2 Checking the Consignment Receipt for Completeness

Flowserve Flow Control GmbH must receive any claims in writing within one month of receipt of the ARGUS ball valve. Note that Flowserve Flow Control GmbH cannot accept later claims.

1. Immediately upon receipt of the ARGUS ball valve check it against the delivery document (delivery note) for completeness.
2. Check the ARGUS ball valve for transportation damage.

3. Immediately report any missing parts and/or damage to the transport agent and to Flowserve Flow Control GmbH.

5.3 Transportation

The following requirements apply to both manual and actuated valve units, as well as to the handling of internal components during assembly and disassembly activities for maintenance.

Ensure that the following conditions apply:

- The ball valve is disconnected from the piping
 - Is free from any fluid residues and trapped pressure (observe national regulations on disposal of hazardous waste)
 - Is in the open position (as supplied)
 - Is free from any dirt
 - Is dry
 - Is free from insulation or other coverings
 - If actuated: All electrical, hydraulic and pneumatic systems have been disconnected.
1. Attach protective factory fitted caps to the ARGUS ball valve (including Volatile Corrosion Inhibitor paper).
 2. Use protective packaging materials to protect the ARGUS ball valve from damage during transport (e.g., packaging cover).

Transport of heavy ARGUS ball valves (≥ 15 kg) requires a suitable hoist. Depending on the type of ball valve, round slings are wrapped around both sides of the ball valve body, or the ball valve's lifting lugs are used, if present. Use a minimum of 4 lifting lugs for ball valves type FK 76M ($\geq$ DN 300).

3. For heavy ARGUS ball valves (≥ 15 kg), attach the hoist to the ball valve in a suitable way (see previous note).

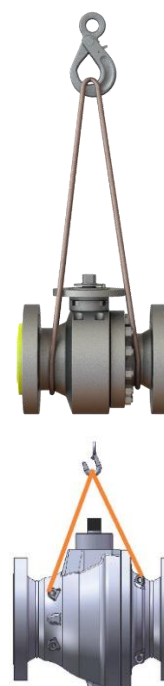
Note that when using round slings, the center of gravity may be above the attachment points.

For center of gravity data refer to Annex E: Centers of Gravity of FK 75M and FK 76M.

Mind the suitable work loads of attachment points given in Annex F: Safe Working Load (SWL) .

5 Packaging, Transportation and Storage

4. For ball valves without lifting eyes fasten the ball valve with round slings around body 1 and 2.
5. For ball valves with lifting eyes fasten the ball valve with round slings in the lifting eyes.
6. Put the lifting straps into the load hook of an appropriate hoist or swing crane.
7. Perform a minimal lift to check balance of the ball valve.
8. Lift the ARGUS ball valve to the desired location and set it down safely.
9. Remove the lifting straps from the ARGUS ball valve



5.4 Packaging

1. Attach protective factory fitted caps to the ARGUS ball valve (including Volatile Corrosion Inhibitor paper).
2. Choose suitable packaging to guarantee that the ARGUS ball valve reaches its destination without any damage (e.g., "seaworthy" packaging).
3. If necessary, protect/secure the ARGUS ball valve against tipping over and slipping.
4. If necessary – particularly in the case of sea freight – display appropriate and clearly visible transportation symbols on the packaging in accordance with ISO 780 and DIN 55402.

Transport symbols on the boxes are either laminated or sprayed on with weatherproof paint.

Possible transportation symbols are:

	<i>This side up</i>		<i>Fragile goods</i>
	<i>Keep dry</i>		<i>Protect from direct sunlight</i>
	<i>Center of gravity</i>		<i>Do not use hooks</i>
	<i>Attach chain here</i>		

5.5 Storage

5.5.1 Short Term Storage

The following instructions are recommended where valve storage is intended for valves that are to be stored on site prior to installation up to six months. Extended storage beyond six months may require additional instructions depending on the location.

During on-site storage, all valves with special cleaning and/or preparation, should be kept in original special packaging as shipped from Flowserve for protection from contamination.

5 Packaging, Transportation and Storage

- Valves should be stored indoors, above ground and protected from harsh environments.
- Always store valves in a clean dry location and away from dust, dirt, debris, corrosive materials and wet areas. Water must not be allowed to enter actuated pneumatic cylinder or electrical connections.
- Keep the valves in a cool location and out of exposure to direct sunlight and excessive heat.
- Ball valves should be stored in the open position.
- Actuated valves should be stored in a horizontal position.

5.5.2 Long Term Storage

In addition to short term instructions the following instructions are recommended where valve storage is intended for valves that are to be stored on site for periods exceeding six months.

- Valves should be stored indoors, above ground and protected from harsh environments where temperature exceeds minimum of -30° C or maximum of 80° C to prevent seal compression set.

Recommended six-month maintenance for long term storage:

1. Visually inspect valve assembly ensuring valve original special packing as shipped from Flowserve is in its original condition.
2. Cycle manual valve three complete cycles.
3. Cycle automated valves using dry instrument air or dry Nitrogen.
4. Replace desiccants and reseal protective packaging.

5.5.3 Elastomers/Soft Good Storage

Per the manufacturers, "All mechanisms by which rubber deteriorates with time are attributed to environmental conditions. Therefore, storage conditions, not time, determine the life of rubber seals." To preserve the physical properties of the components containing elastomers, the following storage conditions must be adhered to:

- Ambient temperatures not to exceed 50 °C.
- Exclusion of all significant contaminants and foreign materials.
- Exclusion of direct sunlight.
- Exclusion of significant radiation.
- Exclusion of significant ozone.

5.5.4 Storing the Ball Valve

1. Transport the ARGUS ball valve to its storage location.
↳ See section 5.3 Transportation.
2. Extend the useful life of the ARGUS ball valve by ensuring the storage conditions for long- and short-term storage detailed above are fulfilled.

The operability of the ARGUS ball valve must be checked by an inspection of the ARGUS ball valve after (longer) storage and before commissioning.

Carry out the maintenance work listed in chapter 8 Maintenance on the ARGUS ball valve.

6 Installation

6.1 Safety Messages



In order to prevent personal injury and/or property damage, ensure that installation work is only carried out by qualified personnel with appropriate personal protective equipment (PPE) and suitable work tools.

☞ See Chapter 3 Safety Information.

⚠ WARNING

Risk of injury due to welding procedures on pressurized piping!

Welding procedures on pressurized piping may cause severe injury or death.

- ▶ Observe local welding regulations, provisions, instructions, and specifications as well as specific safety requirements when welding.
- ▶ Ensure that welding is only carried out by qualified personnel with appropriate protective equipment.
- ▶ Ensure that no welding is carried out on pressurized piping.

⚠ WARNING

Risk of injury due to incorrect ball valve installation!

In case of incorrect ball valve installation (installation direction for unidirectional ball valves does not correspond to the specified flow direction or pressure direction), leakage of the ball valve can lead to serious injury or death.

- ▶ Install the ARGUS ball valve according to the specified flow or pressure direction.
- ▶ Note the following preparations for the flange and welding installation.

NOTICE

Risk of property damage due to flushing and/or pressure testing of the piping!

Flushing pressure and/or a (hydrostatic) pressure testing may cause damages to sealing elements (e.g., at the stem and the stuffing box).

- ▶ Never exceed the operating parameters/limits stated on the ball valve nameplate.
- ▶ Operate the ARGUS ball valve into fully open position.
- ▶ After flushing and/or the pressure testing, check the flange connections again.
- ▶ If necessary, retighten bolts on the flange connection according to the torque specifications of the plant operator.

6.2 Installing/Aligning an Actuator

Actuators are usually installed above the ARGUS ball valve if the stem of the ball valve is in a vertical position. Other types of installation are possible depending on assessment of the specific application conditions.

If the ARGUS ball valve was shipped with a mounting kit only the mounting console is already attached. Mount the actuator according to actuators manual and ensure the following:

- Make sure the valve stem is not pressed or pushed into the valve.
- Avoid any stem binding or side loading when you mount the actuator*.
- Align the actuator properly when you mount it.
- Do not hammer or force down on the stem or stem adapter.
- Tighten all bolts to the required torque.
- Make sure the actuator mounting surface is fully aligned with the mounting bracket.
- Make sure the mounting can handle or adjust to the stem and/or stem adapter expanding due to high temperatures.
- In case of critical vibrations or impacts during operation, it is also useful to additionally support the actuator or provide shock absorption.

For more details on how to mount the actuator, refer to the actuator manual.

*In case of heavy and/or asymmetrical actuators or with units which are not installed vertically, critical bending or torsional forces can occur, especially on extended stems, for example, those equipped with a stuffing box. Have on-site support provided for installing the actuator.

If the ARGUS ball valve was shipped with an actuator the valve will be in the required fail-safe position:

- Inspect the ball valve and actuator.
- Do not unmount the actuator prior to installation.

6.3 Pipeline installation

6.3.1 Preparing the Flange and Welded Installation

When unpackaged, transported and prepared for installation (e.g. actuator and controls installed) the ARGUS ball valve can be installed in the pipeline.

Observe the following measures before installing the ARGUS ball valve:

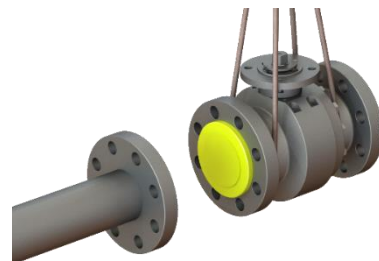
- Ensure that the installation direction for an unidirectional ARGUS ball valve corresponds to the specified flow direction or pressure direction.
- Ensure that the piping is strong enough to safely bear the ARGUS ball valve and its accessories.
Note: The total weight of the ARGUS ball valve including actuator and control modules is specified in the position parts list and assembly drawing.
These documents are available on request, indicating the order and item number.
- Before installing the ARGUS ball valve, ensure that the piping is clean and free of any fluids or other substances. Piping should be flushed with valves open.
- Make sure there is sufficient clearance above and to the side of the ARGUS ball valve and attachments to ensure maintenance and/or repair work without risk.

- If the ARGUS ball valve is intended for regular manual operation, provide a standing area for the operator so he or she can safely apply the necessary forces.
- Inspect the ARGUS ball valve and actuator/controls (if included) for damage.

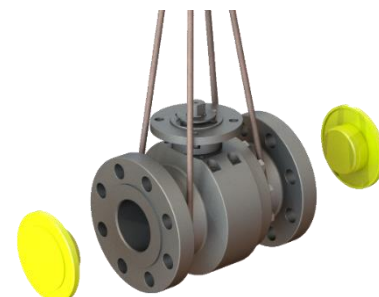
6.3.2 Installing the ARGUS Ball Valve via a Flange Connection

Bolting and gasket material should be compatible with the valve's body material and pressure. Care should be taken that flanges are straight and parallel, all piping is aligned. The length between the pipe flanges should correspond to the valve face-to-face dimensions.

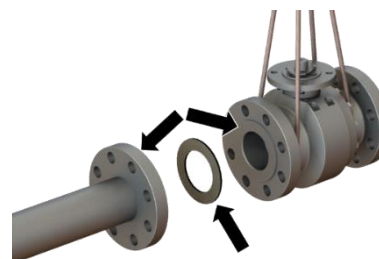
1. Transport the ARGUS ball valve to the installation site using lifting devices suitable and slings for the weight and the size of the ARGUS ball valve.
↳ See section 5.3 Transportation.



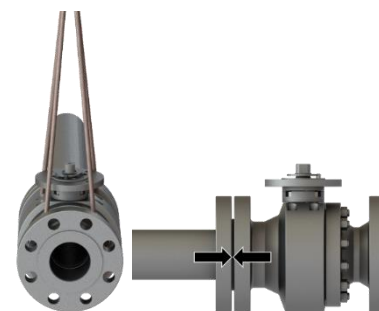
2. Remove the protective caps.



3. Clean the piping ends, flange connections and sealing surfaces.



4. Insert the valve between pipe flanges. Thread bolts through bottom holes and tighten bolts lightly.
5. Insert gaskets between valve and pipe flanges. It is recommended to apply the gasket paste to gasket faces.
6. Ensure the correct alignment of gaskets, which are held by bottom bolts between valve and pipe flanges.
7. Thread bolts through the remaining bolt holes and tighten them lightly.



8. Tighten bolts evenly and gradually in a basic star pattern. The ends of all tightened bolts should protrude equally beyond the nuts.

Use the correct tightening torques specified by the industrial plant operator.



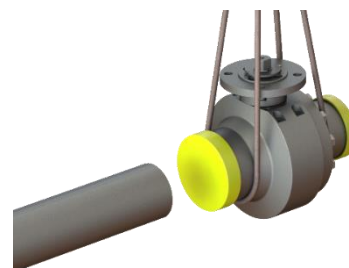
9. Assemble the ARGUS ball valve to the second flange: Follow the same procedure as for the first flange.
10. Check the seal after the flange connection has been completed.
11. Raise the line temperature and pressure gradually and retighten bolts, if necessary.

6.3.3 Installing the ARGUS Ball Valve via a Welded Connection

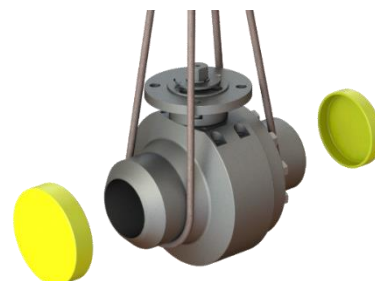
Never make arc strikes on the valve body or end adapter except inside the groove intended for butt welding or inside the corner of the joint for socket welding. Arc strikes made on areas which are not intended to be welded can cause a localized increase in hardness and micro-cracks, and can otherwise compromise the intended mechanical properties of the material.

Excessive temperature and incorrect insulating or stress relieving technique may damage the valve and void the warranty. Care is to be taken to minimize weld slag and splatter within the valve.

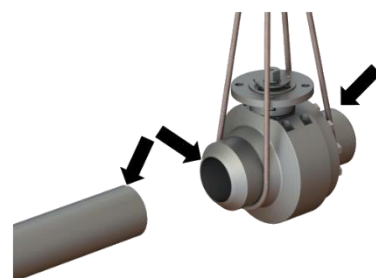
1. Transport the ARGUS ball valve to the assembly location using lifting devices and slings suitable for the weight and the size of the ARGUS ball valve.
↳ See Chapter 5.3 Transportation.



2. Remove the protective caps.



3. Clean the piping connection and the welding ends of the ARGUS ball valve.
4. Remove paint and rust in the area of the welded joints so there is a clean metal surface.
5. Ensure the valve is in the open position prior to any welding

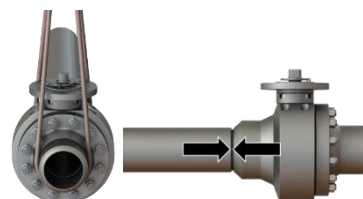


NOTICE

Risk of property damage due to excessive heat development!

In case of short welding ends, excessive heat development may cause damage to the actuator.

- Use radiation shields when welding



Ensure correct placement and correct alignment of the ARGUS ball valve with the piping connection. Install the piping such that pipe loads are minimized on the valve.

6. Attach the welding ground strap to the side of the valve being welded.
7. Weld the valve into the line using welders and procedures fully qualified per the appropriate design, construction, and welding codes for the piping and valve.
8. Apply post weld heat treat in accordance with valve material and code requirements.
9. Cycle the valve to verify proper operation. Ensure that the torque required to cycle the valve has remained within acceptable limits.

6.3.4 Finalize Pipeline Installation

1. If required, install proper insulation and coverings as required for per the piping system insulation specification.
2. If required, complete pressure testing the installed valve per code requirements.

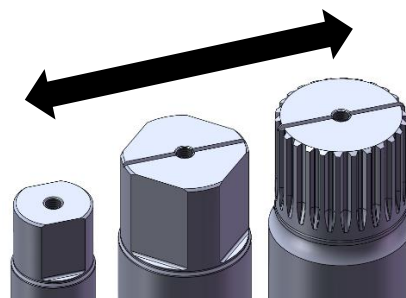
7 Operating the ARGUS Ball Valve

The ARGUS ball valve can be operated manually or automatically by an actuator.

There are three operation positions:

- Open (the ARGUS ball valve opens by rotating to the left or counterclockwise)
- Closed (the ARGUS ball valve closes by rotating to the right or clockwise)
- Half-open (not intended for normal operation)

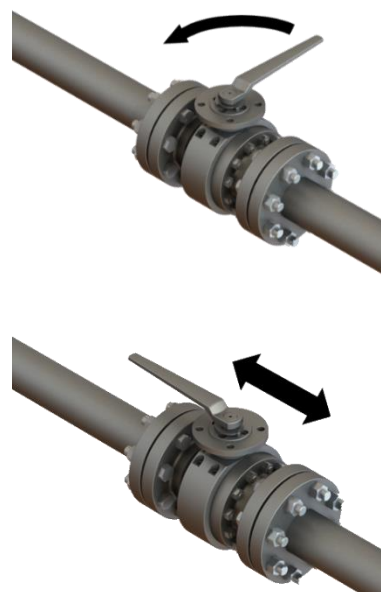
The ARGUS ball valve is open when the flat sides of a double-D operating spindle or the groove of a square operating spindle or toothed operating spindle are parallel to the direction of flow.



If the valve is actuated, read the specific actuator instructions before operating the valve.

7.1 Manually Operating the ARGUS Ball Valve to Open Position

1. Move the ball valve wrench parallel to the valve body/piping.



7.2 Manually Operating the ARGUS Ball Valve to Closed Position

1. Move the ball valve wrench crosswise (90°) to the valve body/piping.



8 Maintenance

8.1 Safety Messages



In order to prevent personal injury and/or property damage, ensure that maintenance work is only carried out by qualified personnel with appropriate personal protective equipment (PPE) and suitable work tools.

⚡ See Chapter 3 Safety Information.

⚠ WARNING

Risk of injury from fluid residues, trapped pressure and/or high surface temperatures!

Fluid residue, trapped pressure and/or high surface temperatures can cause serious injury or death.

- ▶ Before replacing the stuffing box packing, operate the ARGUS ball valve several times that fluid residues and trapped pressure can escape.
- ▶ Do not touch surfaces with high surface temperatures and let them cool down.
- ▶ Collect fluid residues with a collecting container and dispose them properly.

8.2 General

Valve parts are subject to normal wear and must be inspected and replaced as necessary. The frequency of inspection and replacement depends upon the severity of service conditions. Under particularly stressful operating conditions wear and tear to the sealing elements of the ARGUS ball valve may occur before valves in less severe services. In addition, very critical or severe service may require that components of the ARGUS ball valve be periodically renewed.

8.3 Recommended Inspection Schedule

The following inspections can be carried out in the installed state. As a rule, normal industrial plant operation does not have to be interrupted.

In case of any leakage, damage and/or incorrect condition:

➔ See section 9 Troubleshooting Guide.

No.	Inspection	Schedule/Cycles
1	Inspect the flange and welded connection for leakages.	Every 6 months
2	Inspect the ARGUS ball valve's seals for leaks and retighten the stuffing box nuts if present (➔ see section 8.4.1).*	
3	Inspect the test connection (leakage detector at the stem seal) or the drain/safety plug (➔ see sections 10.2) – if present – for leaks to the outside.*	
4	Inspect the ARGUS ball valve for external damage.	
5	If possible during industrial plant operation, open and close the ARGUS ball valve and ensure that the ball valve stem runs smoothly.	
6	Check the actuator for fixed installation and proper function.	
7	Check all accessories for tight fit and proper function.	

*For TA Luft/ISO 15848 valves, inspect at the latest after the number of switching cycles corresponding to the endurance class specified in the certificate (CO1 = 205, CO2 = 1500, CO3 = 2500 cycles) or every 6 months, whichever comes first.

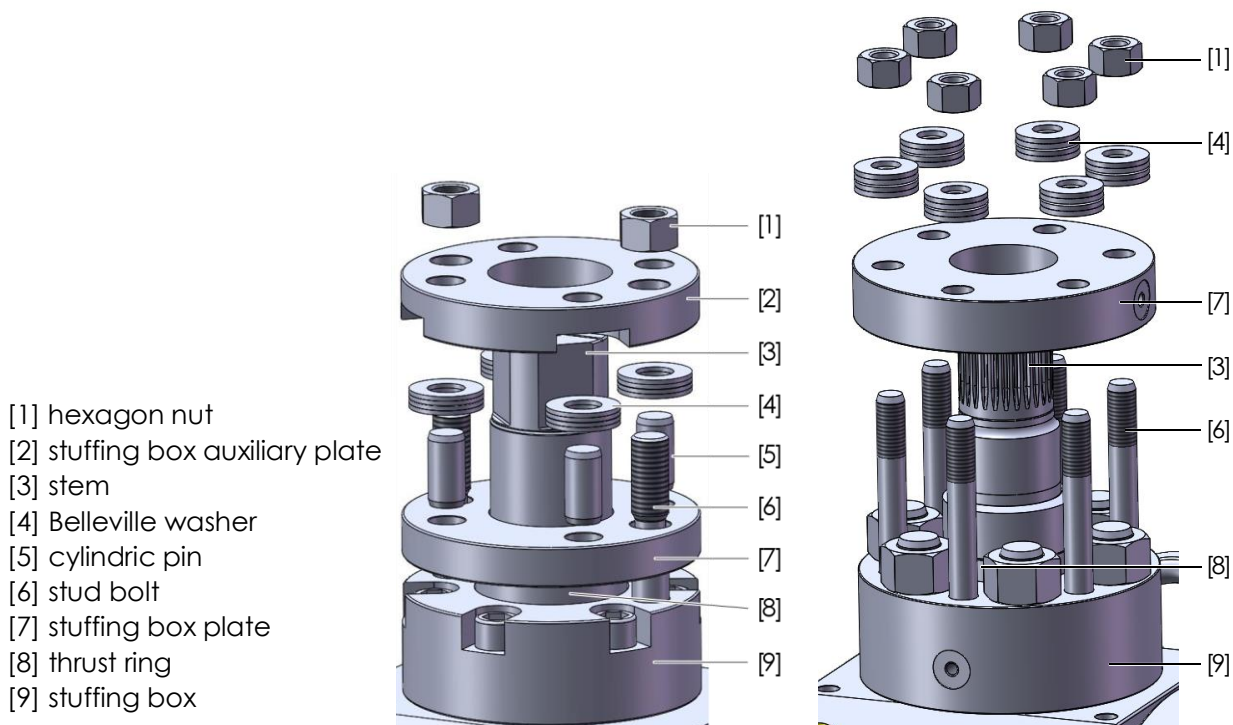
ISO FE AH CO3 SSA0-t(-46 °C; 250 °C)-ISO 15848-1:2017/07

Specification of the endurance class in the TA Luft/ISO 15848 certificate (example)

8.4 Routine Maintenance Procedure

8.4.1 Tightening the Stuffing Box Nuts

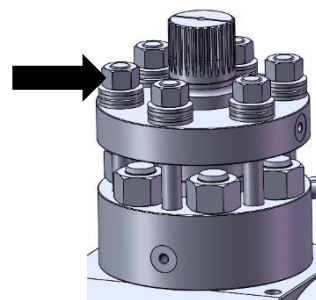
To eliminate a stem leakage of the ARGUS ball valve, the stuffing box nuts have to be retightened or replaced.



Retightening the Stuffing Box Nuts

1. Tighten the stuffing box nuts evenly crosswise.

Do not exceed the recommended maximum torques for tightening the stuffing box nuts in Annex D: Max. Permissible Screw Tightening Torques for Stuffing Box.



If you cannot eliminate a stem leakage of the ARGUS ball valve by tightening the stuffing box nuts, replace the stuffing box packing (see service manual VASIN001504).

8.5 Recommended Spare Parts

To ensure continued satisfactory operation, replacement parts to the original design specification should be obtained from Flowserve. Any change to the original design specification (modification or use of non-standard part) will invalidate the product safety certification.)

Flowserve Flow Control GmbH provides repair sets or replacement kits for each ARGUS ball valve. To order a repair kit, Contact the Flowserve Flow Control GmbH. Clearly identify the ARGUS ball valve so Flowserve Flow Control GmbH can provide the corresponding repair sets or replacement kits. This technical identification can be made either via the customer order documents (e.g. delivery bill or invoice) or via the information on the nameplate.

The following spare parts are needed for each repair:

- Stem packing
- Body gaskets
- Sealing rings

The following spare parts need to be changed depending on their condition:

- Seldom: Disc springs, stem bearing, stem
- Less frequent: Metal trim kit - replacement or repair lapping and Inconel springs
- Rarely: Bolts and nuts

9 Troubleshooting Guide

9.1 Safety Messages



In order to prevent personal injury and/or property damage, ensure that repair work is only carried out by qualified personnel with appropriate personal protective equipment (PPE) and suitable work tools.

☞ See Chapter 3 Safety Information.

⚠ WARNING

Risk of injury due to repair work on the ARGUS ball valve during operation!

Repair work on the ARGUS ball valve during operation and/or while under pressure may cause severe injury or death.

- ▶ Do not attempt to repair the ARGUS ball valve while in operation and/or under pressure.
- ▶ Follow the procedures specified in the embedded safety messages below closely.
- ▶ Contact Flowserve Flow Control GmbH for support if any repairs have to be carried out.

⚠ WARNING

Risk of injury due to repair welding or joint welding on the ARGUS ball valve!

Due to possible non-metallic inclusions in the metal body of the ARGUS ball valve, repair or joint welding is very dangerous and can lead to serious injury or death.

- ▶ Do not perform any repairs or joint welding.
- ▶ Contact Flowserve Flow Control GmbH for support if any repair or joint welding has to be carried out.

9.2 Troubleshooting Table

The following tables (grouped by symptom) will cover the various problems which are common. The information provided in the troubleshooting and repair guide will aid in identifying, isolating and correcting these problems, issues, and malfunctions.

9.2.1 Ball/seat leaking by internally when closed

When to Detect	How to Detect	Possible Cause	Possible Components Affected	Possible-Remedial Action(s)
Before/after disassembly	Visual inspection before disassembling Bubble, vacuum, air test before disassembling	Damaged valve ball/seat	Ball/Seat	Repair/Replace
		Damaged coating on the ball/seat	Ball/Seat	Repair/Replace
		Galling/scoring on ball/seat	Ball/Seat	Repair/Replace
		Seat ring gasket leak on downstream seat	Gaskets	Replace
		Seat ring gasket leak on downstream/upstream seat	Seat	Repair/Replace
Before disassembly	Visual inspection before disassembling	Ball may not be completely closed	Ball	Repair/Replace/ Use as-is
		Ball may not be completely closed	Seat	Repair/Replace/ Use as-is
		Ball may not be completely closed	Stem	Repair/Replace/ Use as-is
		Gear box end stops not set correctly	Ball	Evaluate

9.2.2 Body and stuffing box gasket is leaking externally

When to Detect	How to Detect	Possible Cause	Possible Components Affected	Possible-Remedial Action(s)
Before disassembly	Tight bolts as per specified torque value per IOM	Bolts are loose	Body	Evaluate
			Stuffing box gasket	Replace
			Body gasket	Replace
	Visual inspection after disassembling	High piping stress transmitted through the valve body joint	Gaskets	Replace
	Testing valve operation before disassembly	High piping stress transmitted through the valve body joint	Body	Evaluate
During assembly	Gasket/Sealing extrusion Increased bolting torque	Misalignment of body joints	Body	Repair/Replace/ Use As-is
After disassembly	Visual inspection after disassembling	Body gasket sealing surfaces damaged	Body	Evaluate
			Gaskets	Replace

9.2.3 Loud noise/whistling/hammering during operation

When to Detect	How to Detect	Possible Cause	Possible Components Affected	Possible-Remedial Action(s)
Before disassembly	Review application data	Valve sizing for the application incorrect	n/a	Evaluate
After disassembly	Measurements/ templates	Ball bore position not aligned with body	Ball	Evaluate
			Body	Evaluate
			Seat	Evaluate
			Stem	Evaluate

9.2.4 Stem is leaking externally

Possible Cause	Possible Components Affected	Possible-Remedial Action(s)
Seal misaligned	Body	Evaluate
Valve packing chamber damaged	Body Packing chamber	Evaluate
Gland nuts loose	Gland Nuts	Evaluate
Stem sealing surface	Stem	Repair/Replace

9.2.5 Valve End connection flanges are leaking

Possible Cause	Possible Components Affected	Possible-Remedial Action(s)
Gasket damage	Gaskets	Replace
Flange misalignment	Gaskets	Replace
Gasket application incorrect	Gaskets	Replace

9.2.6 Valve Operational Issues (will not fully open or close, is hard to operate, or is stuck)

Possible Cause	Possible Components Affected	Possible-Remedial Action(s)
Actuator damaged/failed	Actuator	Repair/Replace
Actuator key/keyway damaged	Actuator	Evaluate
Actuator key/keyway damaged	Stem	Repair/Replace
Actuator undersized/underpowered	Actuator	Evaluate
Corroded actuator parts	Actuator and/or components	Repair/Replace
Damaged gear box	Gearbox and/or components	Replace
Stem Bearings	Stem/body/bearings	Replace
Stem packing over-torqued	Gland flange	Repair/Replace/Use as-is

Stem packing over-torqued	Gland follower	Repair/Replace/Use as-is
Stem packing over-torqued	Stem	Repair/Replace
Stem packing over-torqued	Stem packing	Replace
Stem packing over-torqued	Studs/Nuts/Washers	Replace
Foreign objects in the valve internals	Ball	Repair/Replace
Live load springs	Belleville Springs	Replace

9.3 Returning the ARGUS Ball Valve for Repair

If the ARGUS ball valve cannot be repaired using the troubleshooting table above, return the ARGUS ball valve to Flowserve Flow Control GmbH for professional repair.

Note that the ARGUS ball valve must be emptied, cleaned, and a preserving medium applied before being returned to Flowserve Flow Control GmbH.

Flowserve Flow Control GmbH will only open and repair the ARGUS ball valve if the decontamination declaration form and safety data sheet are enclosed.

Flowserve Flow Control GmbH will provide the decontamination declaration form and safety data sheet before return.

The ARGUS ball valve to be returned must be

- Emptied
- Cleaned
- Preserved
- Free from fluid residues and trapped pressure

1. Properly pack the ARGUS ball valve for return.

🔗 See section 5.3 Transportation.

2. Send the completed and signed decontamination declaration form and the safety data sheet in advance to Flowserve Flow Control GmbH or attach the documents to the outside and clearly visible on the return of goods.

The decontamination declaration form and safety data sheet must clearly confirm that the ARGUS ball valve does not pose any risk to persons or to the environment.

Flowserve Flow Control GmbH will accept a return only if the completed and bindingly signed decontamination declaration form and safety data sheet accompany the return.

3. Send the return to Flowserve Flow Control GmbH.

10 Decommissioning

10.1 Safety Messages



*In order to prevent personal injury and/or property damage, ensure that decommissioning work is only carried out by qualified personnel with appropriate personal protective equipment (PPE) and suitable work tools.
🔧 See Chapter 3 Safety Information.*

⚠ DANGER

Risk of injury due to falling loads!

Incorrect attachment of loads may cause severe injury or death.

- ▶ Correctly attach the ARGUS ball valve and/or actuator.
🔧 See section 5.3 Transportation and the superior instructions VAIOM001028.
- ▶ Never stand under heavy load.

⚠ WARNING

Risk of injury due to hot fluid, fluid residues and trapped pressure!

Hot fluid, fluid residue and trapped pressure can cause serious injury or death.

- ▶ Never disassemble a pressurized ARGUS ball valve from the pipeline.
- ▶ Operate the ARGUS ball valve several times so that fluid residues and trapped pressure can escape.
- ▶ Use a container to collect any fluid residues and dispose of them properly.
- ▶ Follow the procedures specified in the embedded safety messages below closely.

10.2 Draining the ARGUS Ball Valve

10.2.1 Draining with Drain Plug (if present)

The drain plug on the bottom of the ARGUS ball valve body, as an optional feature, serves to drain off any fluid residues from the ball valve interior.

Note that the operation and use of the drain plug may vary depending on the type and manufacturer. Therefore the following instructions are intended to illustrate the use only as an example. Information on the exact operation and use of the drain plug can be found in the manufacturer's documentation.

⚠ WARNING

Risk of injury from hot fluid, fluid residues and trapped pressure!

Hot fluid, fluid residues and trapped pressure in the ARGUS ball valve can cause serious injury or death.

- ▶ Before removing and/or loosening the drain plug, operate the ARGUS ball valve several times so that fluid residues and trapped pressure can escape.
- ▶ Let the ARGUS ball valve cool down.
- ▶ Collect any fluid residues and dispose of them properly.

1. Place a container under the plug orifice before draining.
2. Remove the drain plug to drain fluid residues.
3. Dispose the fluid residues that have been collected.
4. Screw the drain plug to the upper part of the ball valve body.



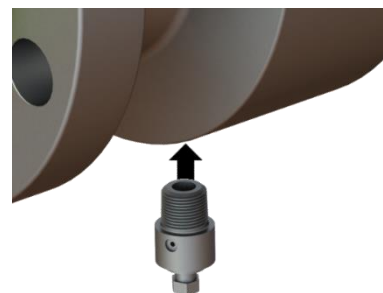
10.2.2 Draining with the Safety Plug (if present)

The safety plug, also called the “captive drain plug” is designed to prevent unintended loss of the drain plug when draining fluid residues. The safety plug can also be closed again immediately when loosening – even if there is overpressure in the ARGUS ball valve.

Note that the operation and use of the safety plug may vary depending on the type and manufacturer. Consequently, the following instructions are intended to illustrate the use only as an example. Information on the exact operation and use of the safety plug can be found in the manufacturer's documentation.

Installing the Safety Plug

1. Screw the complete safety plug tightly into the tapped hole using a thread lock (e.g. Loctite).



Opening the Safety Drain Plug

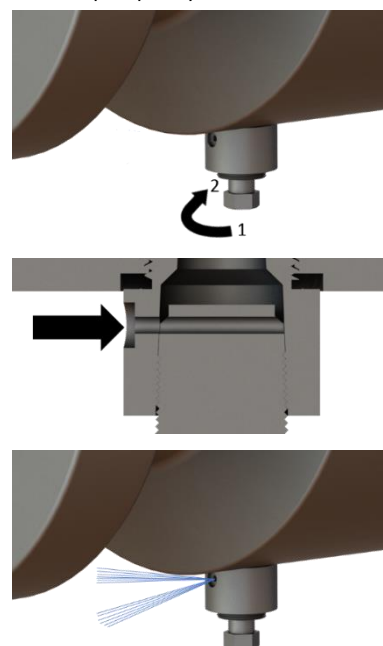
⚠ WARNING

Hot fluid, fluid residues and trapped pressure in the ARGUS ball valve can cause serious injury or death.

- ▶ Before removing and/or loosening the drain plug, operate the ARGUS ball valve several times so that fluid residues and trapped pressure can escape.
- ▶ Let the ARGUS ball valve cool down.
- ▶ Use a container to collect any fluid residues and dispose of them properly.

1. Turn the safety plug head in the counterclockwise direction.

Note that the safety plug head may only be opened, not forcibly screwed out.



Closing the Safety Drain Plug

1. Turn the safety plug head in the clockwise direction.



10.3 Decommissioning and Disassembly of the ARGUS Ball Valve

Before decommissioning and disassembly, observe the following requirements:

- The specifications of the operating company for the decommissioning and disassembly are observed.
- The piping and the ARGUS ball valve are depressurized, free of fluid residues and have cooled down, so there is no risk of injury.

1. Decommission the affected piping system.
2. Operate the ARGUS ball valve several times so that fluid residues and trapped pressure can escape.
3. Flush the pipeline to remove any fluid residue, dirt or other foreign particles.
4. Ensure that there are no fluid residues, dirt or other foreign particles in the pipeline.
5. Disconnect the power supply to the actuator and to its control components.
6. Disconnect the actuator and the control components from the ARGUS ball valve.
7. Disassemble the ARGUS ball valve from the pipeline.
8. When disassembling the ARGUS ball valve, pay attention to the information given in chapter 5.3 Transportation.

10.4 Disposal and Recycling

At the end of the ARGUS ball valve useful life, all materials and parts must be recycled or disposed of in accordance with local/regional environmental laws and regulations. If the ARGUS ball valve contains hazardous substances or toxic fluid residues which are harmful to the environment or to health, removal and disposal of the ARGUS ball valve must adhere to local/regional regulations and laws on waste disposal.

The ARGUS ball valve is

- Decommissioned
 - Disconnected from the piping, the actuator and the control components
 - Depressurized
 - Decontaminated (free from hazardous substances or toxic fluid residues)
1. Consign the ARGUS ball valve to an authorized waste disposal and/or recycling company.

The authorized waste disposal or recycling company will transfer the ARGUS ball valve into the disposal or recycling circuit.

Annex A: Declaration of Conformity



EU Declaration of Conformity acc. Directive 2014/68/EU

(Translation of AZ1787_DE)

Product:

Argus-Ball Valve-Types

Type	DN	Type	DN
FK 75, FK 75M, FK 75F, FK 76, FK 76M, FK 78	65 - 1200	KK 8, KK 51	32 - 80
FK 79, FK 79FC	15 - 100	MW 8	04 - 25
HK 35	40 - 900	MW 2	32 - 40
BK 8, BK 9, BK 10	04 - 25	MW 22	50 - 100
MK 8, MK10	25 - 50	MW 76, MW 76 (Combination), MW 76M	32 - 300

Note: In compliance with article 4 paragraph 3 of Directive 2014/68/EU, ball valves of nominal size up to DN 25 are "designed and manufactured in accordance with the sound engineering practice ... in order to ensure safe use". Such valves do not bear the CE marking.

Manufacturer:

Flowserve Flow Control GmbH
Rudolf-Plank-Str. 2
D-76275 Ettlingen

Directive:

2014/68/EU of the European Parliament and the Council of 15 May 2014 „Pressure Equipment Directive (PED)“

Flowserve Flow Control GmbH, the manufacturer, hereby declares under sole responsibility that the above listed products are in compliance with the provisions of Directive 2014/68/EU. The equipment is subjected to a conformity assessment procedure according Module H. A Full Quality Assurance System as stipulated in annex III section 11 "Module H" is applied.

The quality assurance system is monitored by the notified body:

TÜV Süd Industrie Service GmbH

Westendstraße 199, D-80686 München

Identification code: **0036**

Certificate No.: **DGR-0036-QS-1067-...** (in the valid version)

Technical standards applied:

AD2000 Rulebook, Series A4; EN 12516-2


Peter Benien
Managing Director


Thorsten Hecht
Head of Research & Development

Ettlingen, 01 April 2022

Experience In Motion

Flowserve Flow Control GmbH
argus@flowserve.com
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AZ1787 EN S.1/1
Rev.: Q

Annex B: Declaration of Incorporation



Declaration of Incorporation acc. Directive 2006/42/EC

(Translation of AZ2215_DE)

Product:

Argus-Ball Valve-Types

Type	DN	Type	DN
FK 75, FK 75M, FK 75F, FK76, FK 76M, FK78	65 - 1200	KK 8, KK 51	32 - 80
FK79, FK 79FC	15 - 100	MW 8	04 - 25
HK 35	40 - 900	MW 2	32 - 40
BK 8, BK 9, BK 10	04 - 25	MW 22	50 - 100
MK 8, MK10	25 - 50	MW 76, MW 76 (Combination), MW 76M	32 - 300

Manufacturer and Authorized Person for the Compilation of the Technical Documentation:

Flowserve Flow Control GmbH
Rudolf-Plank-Str. 2
D-76275 Ettlingen

Directive:

2006/42/EC of the European Parliament and the Council of 17. May 2006, „European Machinery Directive“

Flowserve Flow Control GmbH as the manufacturer hereby declares that the above listed ball valve types and their variants, that are intended for automated operation in combination with pneumatic, electric or hydraulic actuation systems fulfill the basic requirements of the Directive 2006/42/EC for "partly completed machinery": Annex I, paragraphs 1.1.2, 1.1.3, 1.1.5, 1.2.1, 1.3.2, 1.3.3, 1.3.4., 1.3.7, 1.3.8, 1.5.2, 1.5.4, 1.5.6, 1.5.7, 1.5.13, 1.6.1, 1.7.1, 1.7.2, 1.7.3 & 1.7.4.

The conformity assessment was carried out in accordance with the harmonized standard EN ISO 12100:2010.

Commissioning is prohibited until it has been ensured that the entire machine or system in which the Flowserve ball valves are installed comply with the provisions of Directive 2006/42/EC.

The relevant technical documentation for partly completed machinery in accordance with Annex VII, part B, has been created and can be provided to national authorities in case of justified requirement.

The operating manual must be observed.

Applied standard:

- EN ISO12100:2010


Peter Benien
Managing Director


Thorsten Hecht
Head of Research & Development

Ettlingen, 01 April 2022

Experience In Motion

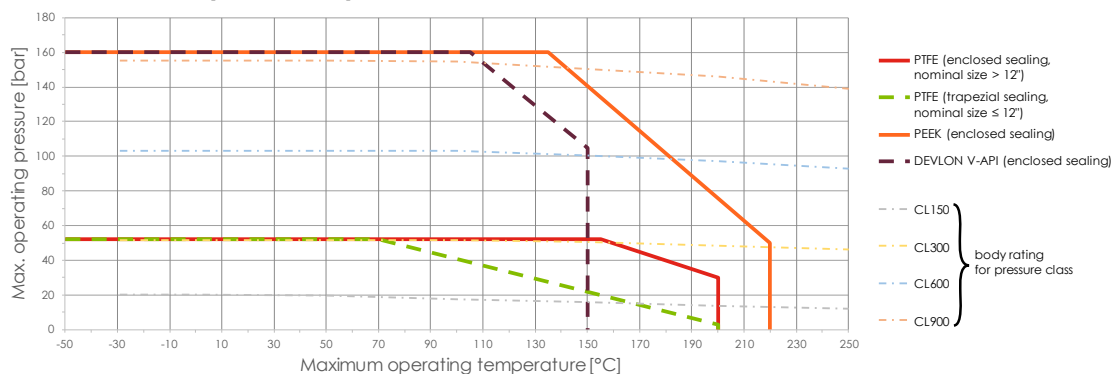
Flowserve Flow Control GmbH
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AZ2215 EN S.1/1
Rev.: C

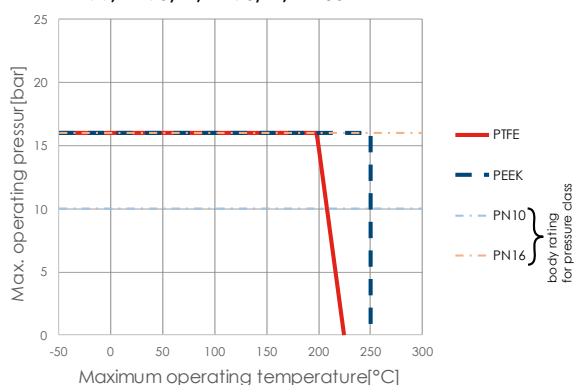
Annex C: Pressure-Temperature Diagrams for Ball Seats

Observe the operating parameters/limits shown in the diagrams.

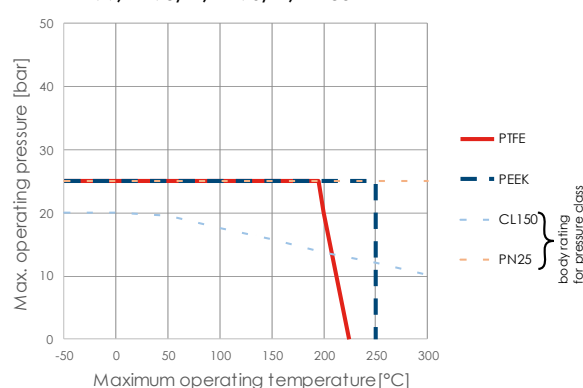
FK 75M, 76M (restructured)



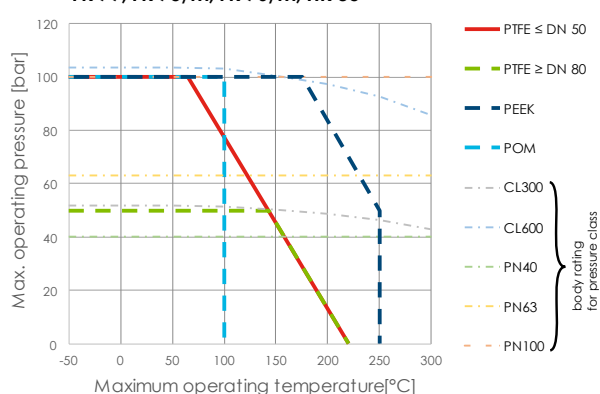
PN 10/16:
FK 79, FK 75/M, FK 76/M, HK 35



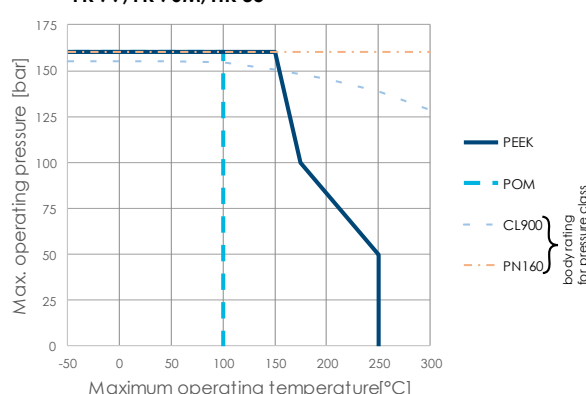
PN 25, Cl. 150:
FK 79, FK 75/M, FK 76/M, HK 35



PN 40/63/100, Cl. 300/600:
FK 79, FK 75/M, FK 76/M, HK 35



PN 160, Cl. 900:
FK 79, FK 76/M, HK 35



The pressure-temperature diagram shows only recommended values. Please contact Flowserve Flow Control GmbH for the evaluation of the process conditions and choice of suitable material.

Annex D: Max. Permissible Screw Tightening Torques for Stuffing Box

Annex D: Max. Permissible Screw Tightening Torques for Stuffing Box

The following values are only valid for the respective standard versions. Please contact Flowserve Flow Control GmbH for unlisted values/special constructions.

Argus Type/ Valve Series	Nominal Diameter		Class	Stem *	Screws		
	DN	NPS			Quantity	Size	Torque Nm
FK 79	15 – 25	0,5" – 1"	150	2FL SW 12	2	M10	13
			300		2		13
			600		2		17
	40 – 50	1,5" – 2"	150	2FL SW 17	2	M10	13
	40 – 50	1,5" – 2"	300		2		16
			600		2		21
FK 76M/ FK 75M	80- 100	3"-4"	150	2FL SW22	2	M10	50
			300	2FL SW27	2	M12	65
			600		2		
			900	W35	2	M16	100
FK 76M	150	6"	150	2FL SW34	2	M12	80
			300		2		
			600		2		
			900	W45	2	M16	165
	200	8"	150	4KT SW46	2	M16	175
			300		2		
			600		2		
			900	W55	2	M16	190
	250	10"	150	4KT SW55	2	M20	255
			300		2		
			600		2		
			900	W65	2	M20	350
	300	12"	150	4KT SW65	2	M20	370
			300		2		
			600		2		
			900	W75	2	M24	470
	350	14"	150	W60	2	M20	350
			300		2		
			600		2		
			900	W70	2	M24	470
	400	16"	150	W80	2	M24	525
			300		2		
			600		2		
			900	W90	2	M27	825
	450	18"	150	W80	2	M24	525
			300		2		
			600		2		
			900	W90	2	M27	825
	500	20"	150	W90	2	M27	825
			300		2		
			600		2		
			900	W100	2	M27	900
	600	24"	150	W100	2	M27	900
			300		2		
			600		2		
			900	W120	2	M30	1160

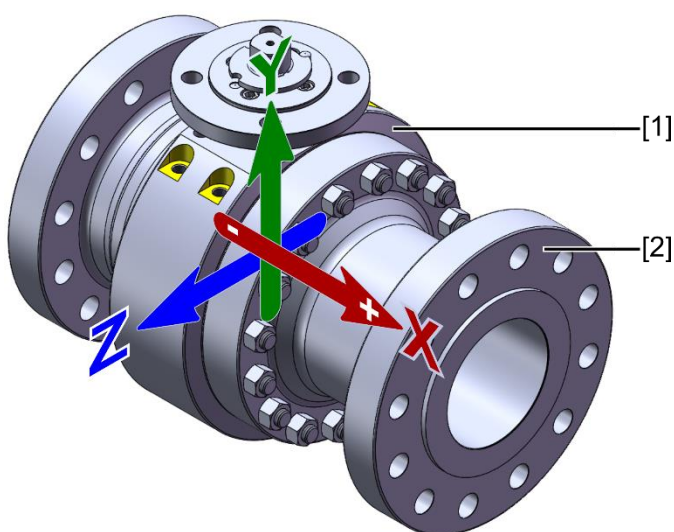
Annex D: Max. Permissible Screw Tightening Torques for Stuffing Box

Argus Type/ Valve Series	Nominal Diameter		Class	Stem *	Screws		
	DN	NPS			Quantity	Size	Torque Nm
HK 35	50	2"	900	2FL SW 19	2	M12	43
			1500		2		72
			2500	4KT SW 27	2	M12	120
	80	3"	900	4KT SW 27	2	M16	87
			1500		2		145
			2500	W 60	2	M27	120
	100	4"	900	4KT SW 36	2	M16	106
			1500		2		177
			2500	4KT SW 55	2	M27	150
	150 – 200	6" – 8"	900	4KT SW 55	2	M20	90
			1500		2		90
			2500	W 75	2	M27	220
	250	10"	900	W 80	2	M20	117
			1500		2		117
			2500	W 100	2	M30	390
	300	12"	900	W 80	2	M20	117
			1500	W 90	2	M30	290
			2500	W 120	2	M36	550
				W 120	4	M30	230

*Legend stem designation: 2FL = double-D stem, 4KT = square stem,
SW = width across flats, number indicates width across flats in mm,
W = toothed stem, number indicates tooth width in mm

Annex E: Centers of Gravity of FK 75M and FK 76M series

Argus Typ/Valve series	Nominal Diameter		Pressure Rating		Center of gravity		
	DN	NPS	PN	CLASS	x [mm]	y [mm]	z [mm]
FK 75M	80 - 100	3" - 4"	10-40	150 - 300	5 ±10	5 ±5	0 ±5
FK 76M	80 - 125red	3" - 5"red	10 - 100	150 - 600	10 ±10	5 ±5	0 ±5
			160	900	15 ±10	5 ±5	0 ±5
	150 - 300	6" - 12"	10 - 100	150 - 600	30 ±20	10 ±5	0 ±5
			-	900	0 ±10	5 ±5	0 ±5
	350 - 600	14" - 24"	-	150-900	0 ±10	0 ±10	0 ±5



x: Offset from the stem axis: - = shift towards body 1 [1]; + = shift towards body 2 [2] (only relevant for two-part bodies)

y: Offset from the flow axis: - = shift towards the bottom; + = shift towards the stem

z: Offset from the stem axis at a right angle to the flow axis

Annex F: Safe Working Load (SWL) of Attachment Points

ADB Safety Engineered Hoist Rings / Heavy Duty Hoist Rings

Thread Size	SWL	
[Inch]	[kg]	[lbs]
UNC 3/8"-16	454	1000
UNC 3/8"-16	454	1000
UNC 1/2"-13	1021	2250
UNC 5/8"-11	1814	4000
UNC 3/4"-10	2268	5000
UNC 7/8"-9	3629	8000
UNC 1"-8	4536	10000
UNC 1 1/4"-7	6804	15000
UNC 1 3/8"-6	9072	20000
UNC 1 1/2"-6	10886	24000
UNC 2"-4,5	13608	30000

SunPoint Eyebolts SPK

Thread Size	SWL	
[mm]	[kg]	[lbs]
M6	100	220
M8	300	661
M10	400	882
M12	750	1.653
M16	1500	3307
M20	2300	5071
M24	3200	7055
M30	4500	9921
M36	7000	15432
M42	9000	19841



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